



SEQUENCE LISTING

<110> Jongsma, Maarten Anthonie
Stiekema, Willem Johannes
Bosch, Hendrik
Turk, Vito
Gruden, Kristina
Lenarcic, Brigita
Strukelj, Borut

<120> A Method for Plant Protection Against Insects or Nematodes

<130> 250308-1020

<140> 09/445,480
<141> 2000-07-07

<150> PCT/NL98/00352
<151> 1998-06-18

<160> 31

<170> PatentIn version 3.2

<210> 1
<211> 888
<212> DNA
<213> Actinia equina

<300>
<301> Gruden, Kristina; Strukelj, Borut; Popovic, Tatjana; Lenarci
C,
Brigita; Bevec, Tadeja; Brzin, Joze; Kregar, Igor;
Herzog-Velikonja, Jana; Stiekema, Willem J; Bosch, Dirk
<302> The Cysteine Protease Activity of Colorado Potato Beetle
(Leptinotarsa decemlineata) Guts, Which is Insensitive to Po
tato
Protease Inhibitors, is Inhibited by Thyroglobulin Type -1
<303> Insect Biochem. Mol. Biol.
<304> 28
<306> 549-560
<307> 1998

<400> 1
ctatggctct tagccaaaac caagccaagt tttccaaagg attcgtcgtg atgatttggg
60
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120

tccaggcctc ggctaacagt ggtctgatag gtacttatgt accacaatgc aaagaaacgg
180

gagagttcga agaaaaacaa tgctggggat cgactgggta ctgttggtgt gtggatgaag
240

atggaaaaga gattctagga accaagatcc gtggatctcc ggattgcagc cgcagaaaag
300

ccgcgttaac actttgccag atgatgcaag ccatcattgt taatgtccct ggttggtgtg
360

gccctccatc gtgtaaagct gacggcagtt ttgacgaggt tcagtgctgc gcaagtaatg
420

gagaatgcta ctgtgtggat aagaaaggaa aagaacttga aggcacaaga caacagggaa
480

ggccaacctg cgaaagacac ctaagcgaat gcgaggaagc tcgaatcaag gcgcattcaa
540

acagtcttcg tgttgagatg ttcgtgccag agtgtttaga agatggatca tataaccag
600

tacagtgctg gcctagcaca ggatactgtt ggtgcgtcga tgaaggaggg gtaaagggtac
660

caggttccga tgtcagatgt aaacgccccca catgctaaga aaaacacagt gaacaaagtg
720

gctagtttcc agatcgaaaa taactacaaa ggattaataa aatgttaaaa taattttctca
780

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840

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888

<210> 2

<211> 231

<212> PRT

<213> Actinia equina

<400> 2

Met Ala Leu Ser Gly Ala Gly Ala Leu Pro Ser Leu Gly Pro Val Val
 1 5 10 15

Met Ile Thr Val Leu Pro Ile Ala Cys Ala Ile Thr Ser Thr Gly Ala
 20 25 30

Ser Leu Thr Leu Cys Gly Gly Leu Gly Ala Ser Ala Ala Ser Gly Leu
 35 40 45

Ile Gly Thr Thr Val Pro Gly Cys Leu Gly Thr Gly Gly Pro Gly Gly
 50 55 60

Leu Gly Cys Thr Gly Ser Thr Gly Thr Cys Thr Cys Val Ala Gly Ala
 65 70 75 80

Gly Leu Gly Ile Leu Gly Thr Leu Ile Ala Gly Ser Pro Ala Cys Ser
 85 90 95

Ala Ala Leu Ala Ala Leu Thr Leu Cys Gly Met Met Gly Ala Ile Ile
 100 105 110

Val Ala Val Pro Gly Thr Cys Gly Pro Pro Ser Cys Leu Ala Ala Gly
 115 120 125

Ser Pro Ala Gly Val Gly Cys Cys Ala Ser Ala Gly Gly Cys Thr Cys
 130 135 140

Val Ala Leu Leu Gly Leu Gly Leu Gly Gly Thr Ala Gly Gly Gly Ala
 145 150 155 160

Pro Thr Cys Gly Ala His Leu Ser Gly Cys Gly Gly Ala Ala Ile Leu
 165 170 175

Ala His Ser Ala Ser Leu Ala Val Gly Met Pro Val Pro Gly Cys Leu
 180 185 190

Gly Ala Gly Ser Thr Ala Pro Val Gly Cys Thr Pro Ser Thr Gly Thr
 195 200 205

Cys Thr Cys Val Ala Gly Gly Gly Val Leu Val Pro Gly Ser Ala Val
 210 215 220

Ala Pro Leu Ala Pro Thr Cys
 225 230

<210> 3
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 <213> artificial sequence

<220>
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<400> 3
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ctattcattg cttgtgctat cacttcaact gaagctagtc taacgaaatg ccaacagctg
 120

caggcctcgg ctaacagtgg tctgataggt acttatgtac cacaatgcaa agaaactgga
 180

gagtttgaag aaaagcaatg ctggggatcg actggttact gttgggtgtgt ggatgaagat
 240

ggaaaagaga ttctaggtac aaagatccgt ggatctccag actgcagtcg cagaaaagct
 300

gccttaacac ttgccagat gatgcaagcc atcattgtga atgtccctgg ttggtgtgga
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cctccatcat gtaaagctga cggcagtttt gacgagggtc agtgctgcgc aagtaatgga
 420

gaatgctact gtgtggataa gaaaggaaaa gaacttgaag gcacaagaca acaggggaagg
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ccaacctgcg aaagacacct aagcgaatgc gaggaggctc gtatcaaggc acattcaaac
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agtcttcgtg ttgagatggt cgtgccagag tgtttagaag atggatctta caaccctgta
600

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660

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<213> artificial sequence

<220>
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Met Ala Leu Ser Gly Ala Gly Ala Leu Pro Ser Leu Gly Pro Val Val
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Met Ile Thr Val Leu Pro Ile Ala Cys Ala Ile Thr Ser Thr Gly Ala
20 25 30

Ser Leu Thr Leu Cys Gly Gly Leu Gly Ala Ser Ala Ala Ser Gly Leu
35 40 45

Ile Gly Thr Thr Val Pro Gly Cys Leu Gly Thr Gly Gly Pro Gly Gly
50 55 60

Leu Gly Cys Thr Gly Ser Thr Gly Thr Cys Thr Cys Val Ala Gly Ala
65 70 75 80

Gly Leu Gly Ile Leu Gly Thr Leu Ile Ala Gly Ser Pro Ala Cys Ser
85 90 95

Ala Ala Leu Ala Ala Leu Thr Leu Cys Gly Met Met Gly Ala Ile Ile
100 105 110

Val Ala Val Pro Gly Thr Cys Gly Pro Pro Ser Cys Leu Ala Ala Gly
 115 120 125

Ser Pro Ala Gly Val Gly Cys Cys Ala Ser Ala Gly Gly Cys Thr Cys
 130 135 140

Val Ala Leu Leu Gly Leu Gly Leu Gly Gly Thr Ala Gly Gly Gly Ala
 145 150 155 160

Pro Thr Cys Gly Ala His Leu Ser Gly Cys Gly Gly Ala Ala Ile Leu
 165 170 175

Ala His Ser Ala Ser Leu Ala Val Gly Met Pro Val Pro Gly Cys Leu
 180 185 190

Gly Ala Gly Ser Thr Ala Pro Val Gly Cys Thr Pro Ser Thr Gly Thr
 195 200 205

Cys Thr Cys Val Ala Gly Gly Gly Val Leu Val Pro Gly Ser Ala Val
 210 215 220

Ala Pro Leu Ala Pro Thr Cys
 225 230

<210> 5
 <211> 18
 <212> DNA
 <213> artificial sequence

<220>
 <223> primer

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 <222> (3)..(3)
 <223> n = A, C, G, T

<220>

<221> misc_feature
<222> (6)..(6)
<223> n = A, C, G, T

<220>
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<222> (9)..(9)
<223> n = A, G

<220>
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<222> (12)..(12)
<223> n = T, C

<220>
<221> misc_feature
<222> (15)..(15)
<223> n = A, G

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = A, G

<400> 5
ctnacnaant gncancan
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<210> 6
<211> 21
<212> DNA
<213> artificial sequence

<220>
<223> primer

<220>
<221> misc_feature
<222> (4)..(4)
<223> n = A, G

<220>
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<222> (7)..(7)
<223> n = A, C, G, T

<220>
 <221> misc_feature
 <222> (10)..(10)
 <223> n = A, C, G, T

<220>
 <221> misc_feature
 <222> (13)..(13)
 <223> n = A, C, G, T

<220>
 <221> misc_feature
 <222> (16)..(16)
 <223> n = T, C

<220>
 <221> misc_feature
 <222> (19)..(49)
 <223> n = A, G

<400> 6
 attnacntgn ggncgnttna a
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<210> 7
 <211> 48
 <212> PRT
 <213> artificial sequence

<220>
 <223> conserved sequence

<220>
 <221> MISC_FEATURE
 <222> (1)..(48)
 <223> X = any amino acid

<400> 7

Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro Xaa Cys
 1 5 10 15

Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Gly Cys Xaa Xaa Xaa Xaa Xaa
 20 25 30

Xaa Cys Thr Cys Val Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Xaa Cys
 35 40 45

<210> 8
 <211> 7
 <212> PRT
 <213> artificial sequence

<220>
 <223> synthetic substrate

<220>
 <221> misc_feature
 <222> (5)..(5)
 <223> x=nitrophenylalanine

<400> 8

Pro Thr Gly Pro Xaa Ala Leu
 1 5

<210> 9
 <211> 30
 <212> DNA
 <213> artificial sequence

<220>
 <223> primer

<400> 9
 cgcgccatgg cgagtctaac caaatgccaa
 30

<210> 10
 <211> 30
 <212> DNA
 <213> artificial sequence

<220>
 <223> primer

<400> 10
 ggggtgcggcc gcgcatgtgg ggcgtttaaa

30

<210> 11
<211> 31
<212> DNA
<213> artificial sequence

<220>
<223> primer

<400> 11
gggggggaat tcctgacctc ttactaactc g
31

<210> 12
<211> 47
<212> DNA
<213> artificial sequence

<220>
<223> primer

<400> 12
gggggggagc tcagatcttg ccatgggtttt tcttctcttt ttttttg
47

<210> 13
<211> 30
<212> DNA
<213> artificial sequence

<220>
<223> primer

<400> 13
agatctgagc tctcgttcaa acatttgga
30

<210> 14
<211> 27
<212> DNA
<213> artificial sequence

<220>

<223> primer

<400> 14
aagcttgaat tcgatctagt aacatag
27

<210> 15
<211> 24
<212> DNA
<213> artificial sequence

<220>
<223> primer

<400> 15
ggggccatgg ctcttagcca aaac
24

<210> 16
<211> 32
<212> DNA
<213> artificial sequence

<220>
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<400> 16
gggggagatc tttagcatgt ggggcgttta aa
32

<210> 17
<211> 6
<212> PRT
<213> artificial sequence

<220>
<223> conserved sequence

<400> 17
Gly Thr Cys Thr Cys Val
1 5

<210> 18

<211> 65
 <212> PRT
 <213> Human Invariant Chain

<400> 18

Leu Thr Lys Cys Gln Glu Glu Val Ser His Ile Pro Ala Val His Pro
 1 5 10 15

Gly Ser Phe Arg Pro Lys Cys Asp Glu Asn Gly Asn Tyr Leu Pro Leu
 20 25 30

Gln Cys Tyr Gly Ser Ile Gly Tyr Cys Trp Cys Val Phe Pro Asn Gly
 35 40 45

Thr Glu Val Pro Asn Thr Arg Ser Arg Gly His His Asn Cys Ser Glu
 50 55 60

Ser
 65

<210> 19
 <211> 67
 <212> PRT
 <213> rat invariant chain

<400> 19

Lys Val Leu Thr Lys Cys Gln Glu Glu Val Ser His Ile Pro Asp Val
 1 5 10 15

His Pro Gly Ala Phe Arg Pro Lys Val Asp Glu Asn Gly Asn Tyr Met
 20 25 30

Pro Leu Gln Cys His Gly Ser Thr Gly Tyr Cys Trp Cys Val Phe Pro
 35 40 45

Asn Gly Thr Glu Val Pro His Thr Lys Ser Arg Gly Arg His Asn Cys
 50 55 60

Ser Glu Pro
65

<210> 20
<211> 74
<212> PRT
<213> chum salmon egg inh.

<400> 20

His Val Pro Ile Asp Gly Ile Phe His Leu Lys Thr Pro Cys Glu Leu
1 5 10 15

Ala Arg Asp Ala Ala Thr His Gly Pro Ile Gly Gly Phe Ile Pro Thr
20 25 30

Cys Asp Tyr Asn Gly Gln Tyr Thr Pro Glu Gln Cys Trp Gly Ser Thr
35 40 45

Gly Tyr Cys Trp Cys Val Asn Ser Ser Gly Gln Lys Leu Pro Gly Thr
50 55 60

Asp Thr Pro Pro Gly Ser Ala Ser Asn Cys
65 70

<210> 21
<211> 69
<212> PRT
<213> Mouse Nidogen

<400> 21

Glu His Ile Leu Gly Ala Ala Gly Gly Ala Asp Ala Gln Arg Pro Thr
1 5 10 15

Leu Gln Gly Met Phe Val Pro Gln Cys Asp Glu Tyr Gly His Tyr Val
20 25 30

Pro Thr Gln Cys His His Ser Thr Gly Tyr Cys Trp Cys Val Asp Arg

35

40

45

Asp Gly Arg Glu Leu Glu Gly Ser Arg Thr Pro Pro Gly Met Arg Pro
 50 55 60

Pro Cys Leu Ser Thr
 65

<210> 22
 <211> 68
 <212> PRT
 <213> Human Epithelial Glycoprot

<400> 22

Gly Ser Lys Leu Gly Arg Arg Ala Lys Pro Glu Gly Ala Leu Gln Asn
 1 5 10 15

Asn Asp Gly Leu Tyr Asp Pro Asp Cys Asp Glu Ser Gly Leu Phe Lys
 20 25 30

Ala Lys Gln Cys Asn Gly Thr Ser Met Cys Trp Cys Val Asn Thr Ala
 35 40 45

Gly Val Arg Arg Thr Asp Lys Asp Thr Glu Ile Thr Cys Ser Glu Arg
 50 55 60

Val Arg Thr Tyr
 65

<210> 23
 <211> 65
 <212> PRT
 <213> Bull Frog Saxiphilin

<400> 23

Lys Cys Leu Lys Glu Arg Gln Val Ala Leu Gly Gly Asp Glu Lys Val
 1 5 10 15

Leu Gly Arg Phe Val Pro Gln Cys Asp Glu Lys Gly Asn Tyr Glu Pro
 20 25 30

Gln Gln Phe His Gly Ser Thr Gly Tyr Ser Trp Cys Val Asn Ala Ile
 35 40 45

Gly Glu Glu Ile Ala Gly Thr Lys Thr Pro Pro Gly Lys Ile Pro Ala
 50 55 60

Cys
 65

<210> 24
 <211> 45
 <212> PRT
 <213> Thyroglobulin 1.1

<400> 24

Tyr Val Pro Gln Cys Ala Glu Asp Gly Ser Phe Gln Thr Val Gln Cys
 1 5 10 15

Gln Asn Asp Gly Arg Ser Cys Trp Cys Val Gly Ala Asn Gly Ser Glu
 20 25 30

Val Leu Gly Ser Arg Gln Pro Gly Arg Pro Val Ala Cys
 35 40 45

<210> 25
 <211> 45
 <212> PRT
 <213> Thyroglobulin 1.2

<400> 25

Tyr Leu Pro Gln Cys Gln Asp Ser Gly Asp Tyr Ala Pro Val Gln Cys
 1 5 10 15

Asp Val Gln His Val Gln Cys Trp Cys Val Asp Ala Glu Gly Met Glu

20

25

30

Val Tyr Gly Thr Arg Gln Leu Gly Arg Pro Lys Arg Cys
 35 40 45

<210> 26
 <211> 43
 <212> PRT
 <213> Thyroglobulin 1.5

<400> 26

Phe Val Pro Ser Cys Thr Thr Glu Gly Ser Tyr Glu Asp Val Gln Cys
 1 5 10 15

Phe Ser Gly Glu Cys Trp Cys Val Asn Ser Trp Gly Lys Glu Leu Pro
 20 25 30

Gly Ser Arg Val Arg Asp Gly Gln Pro Arg Cys
 35 40

<210> 27
 <211> 44
 <212> PRT
 <213> Thyroglobulin 1.6

<400> 27

Phe Val Pro Ala Cys Thr Ser Glu Gly His Phe Leu Pro Val Gln Cys
 1 5 10 15

Phe Asn Ser Glu Cys Tyr Cys Val Asp Ala Glu Gly Gln Ala Ile Pro
 20 25 30

Gly Thr Arg Ser Ala Ile Gly Lys Pro Lys Lys Cys
 35 40

<210> 28
 <211> 70
 <212> PRT

<213> Bovine Thyroglobulin

<400> 28

Gln Cys Pro Ser Leu Cys Glu Val Leu Gln Ser Gly Val Pro Ser Arg
1 5 10 15

Arg Thr Ser Pro Gly Tyr Ser Pro Ala Cys Arg Ala Glu Asp Gly Gly
20 25 30

Phe Ser Pro Val Gln Cys Asp Pro Ala Gln Gly Ser Cys Trp Cys Val
35 40 45

Leu Gly Ser Gly Glu Glu Val Pro Gly Thr Arg Val Ala Gly Ser Gln
50 55 60

Pro Ala Cys Glu Ser Pro
65 70

<210> 29

<211> 80

<212> PRT

<213> Mouse Entactin

<400> 29

Lys Thr Arg Cys Gln Leu Glu Arg Glu His Ile Leu Gly Ala Ala Gly
1 5 10 15

Gly Ala Asp Ala Gln Arg Pro Thr Leu Gln Gly Met Phe Val Pro Gln
20 25 30

Cys Asp Glu Tyr Gly His Tyr Val Pro Thr Gln Cys His His Ser Thr
35 40 45

Gly Tyr Cys Trp Cys Val Asp Arg Asp Gly Arg Glu Leu Glu Gly Ser
50 55 60

Arg Thr Pro Pro Gly Met Arg Pro Pro Cys Leu Ser Thr Val Ala Pro

65 70 75 80

<210> 30
 <211> 82
 <212> PRT
 <213> Human IGF-Binding Protein-3

<400> 30

Tyr Gly Pro Cys Arg Arg Glu Met Glu Asp Thr Leu Asn His Leu Lys
 1 5 10 15

Phe Leu Asn Val Leu Ser Pro Arg Gly Val His Ile Pro Asn Cys Asp
 20 25 30

Lys Lys Gly Phe Tyr Lys Lys Lys Gln Cys Arg Pro Ser Lys Gly Arg
 35 40 45

Lys Arg Gly Phe Cys Trp Cys Val Asp Lys Tyr Gly Gln Pro Leu Pro
 50 55 60

Gly Tyr Thr Thr Lys Gly Lys Glu Asp Val His Cys Tyr Ser Met Gln
 65 70 75 80

Ser Lys

<210> 31
 <211> 77
 <212> PRT
 <213> Human Testican

<400> 31

Gln Lys Pro Gly Gly Leu Pro Cys Gln Asn Glu Met Asn Arg Ile Gly
 1 5 10 15

Lys Leu Ser Lys Gly Lys Ser Leu Leu Gly Ala Phe Ile Pro Arg Cys
 20 25 30

Asn Glu Glu Gly Tyr Tyr Lys Ala Thr Gln Cys His Gly Ser Thr Gly
35 40 45

Gln Cys Trp Cys Val Asp Lys Tyr Gly Asn Glu Leu Ala Gly Ser Arg
50 55 60

Lys Gln Gly Ala Val Ser Cys Glu Glu Glu Gln Glu Thr
65 70 75